

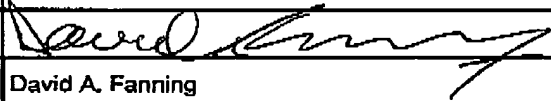
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	Examiner Name	Boyer D. Ashley	
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ENCLOSURES (Check all that apply)		
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SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT			
Firm Name	SD3, LLC		
Signature			
Printed name	David A. Fanning		
Date	February 6, 2006	Reg. No.	33,233

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FEB 06 2006

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of
STEPHEN F. GASS, J. DAVID FULMER and
JOEL F. JENSEN

Date: February 6, 2006

Serial No.: 09/929,221

Examiner Boyer D. Ashley

Filed: August 13, 2001

Group Art Unit 3724

For: APPARATUS AND METHOD FOR DETECTING DANGEROUS
CONDITIONS IN POWER EQUIPMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

APPEAL BRIEF**1. Real party in interest.**

The real party in interest is SD3, LLC, the assignee of the above-identified application. SD3 is a privately owned Oregon limited liability company.

2. Related appeals and Interferences.

All other known prior and pending appeals, interferences or judicial proceedings which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal are listed below. These appeals are listed because they relate to various aspects of safety systems for power equipment and because SD3, LLC is the real party in interest.

1. Appeal of application serial number 09/929,227 (notice of appeal filed).
2. Appeal of application serial number 09/929,238 (notice of appeal filed).
3. Appeal of application serial number 09/929,240 (notice of appeal filed).
4. Appeal of application serial number 09/929,242 (notice of appeal filed).

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Page 1 - APPEAL BRIEF
Serial No. 09/929,221

5. Appeal of application serial number 09/929,426 (examiner reopened prosecution after applicant filed an appeal brief).
6. Appeal of application serial number 09/929,425 (appeal brief filed, awaiting examiner's answer).
7. Appeal of application serial number 10/053,390 (appeal brief filed, awaiting examiner's answer).
8. Appeal of application serial number 10/100,211 (notice of appeal filed).
9. Appeal of application serial number 10/189,027 (appeal brief filed, awaiting examiner's answer).
10. Appeal of application serial number 10/189,031 (notice of appeal filed).
11. Appeal of application serial number 10/243,042 (examiner reopened prosecution after applicant filed an appeal brief).

3. Status of claims.

The application was filed with claims 1-18 and claims 19-24 were added during prosecution. Claims 7, 8, 11, 15 and 18 were cancelled without prejudice. Claims 1-6, 9, 17 and 19-24 were allowed. Claim 16 was objected to as being dependent upon a rejected base claim.¹ Claims 10 and 12-14 were rejected. The appealed claims are claims 10 and 12-14.

4. Status of amendments.

All amendments have been entered.

¹ The summary page of the Final Office Action mailed September 7, 2005 indicates that claim 16 was rejected. However, the text of the action says claim 16 was objected to and would be allowable if rewritten to include limitations from parent claims. (Final Office Action mailed 9-7-06, p. 4.)

5. Summary of claimed subject matter.

The claims in this appeal relate to capacitive couplings used in safety systems for woodworking machines. Woodworking machines such as table saws, miter saws, chop saws, radial arm saws, circular saws, band saws, jointers, and planers have cutting tools or blades that present a danger to persons using the machines, and each year tens of thousands of people in the United States are severely injured on such machines.² New safety technology has been invented to address this problem. The technology detects when an unsafe condition arises between a person and the cutting tool and then performs some action to prevent or mitigate any injury. One embodiment of the technology is a table saw configured to detect contact between a person and the blade and to stop the blade from spinning upon detection of contact. Such table saws are now being sold under the name SawStop, and those saws have already saved the hands or fingers of at least 27 different people who had accidents while using the saws.³ Those people likely would have suffered life-changing lacerations or amputations if they had been working on non-SawStop saws. Instead, in each case the person walked away with no more than a scratch. A number of patent applications have been filed to protect different inventions related to the new technology and this is one of those applications.

² The U.S. Consumer Product Safety Commission, National Electronic Injury Surveillance System, Directorate for Epidemiology, estimates 58,958 injuries involving various types of power saws and 20,899 injuries involving "saws, not specified" during 2004. (These statistics are publicly available at www.cpsc.gov. The relevant product codes for searching include codes 825, 832, 841, 842, 843, and 845.)

³ SawStop saws are made and sold by SawStop, LLC, a wholly-owned subsidiary of applicant SD3, LLC. Pictures and videos of SawStop saws can be seen on the Internet at www.sawstop.com.

Specifically, independent claim 10 describes a woodworking machine (shown schematically at 10 in Figure 1) having a motor (such as motor assembly 16 shown schematically in Figure 1), an electrically isolated, rotatable arbor (shown at 42 in Figures 2-7) configured to be driven by the motor, and a circular blade coupled to the arbor (such as cutting tool 14 shown schematically in Figure 1 or blade 40 shown in Figures 2-5 and 10-12). An excitation system is adapted to generate an electrical signal and a capacitive coupling is adapted to capacitively couple the excitation system to the arbor to transfer at least a portion of the signal to the blade. The capacitive coupling includes two spaced-apart conductors with a dielectric between them. One of the conductors could be plate 44 or 46 shown in Figures 5-9. At least a portion of the outer surface of the arbor is the other conductor. The signal on the blade may then be monitored for changes indicative of contact between a person and the blade. Embodiments of capacitive couplings to arbors are discussed in paragraphs 54 through 68 of the specification as published, and on page 21, line 8 through page 26, line 20 of the specification as originally submitted.

Independent claim 12 describes a woodworking machine having a contact detection system (shown schematically at 22 in Figure 1) adapted to detect when a person comes into contact with a cutting tool. The contact detection system includes two electrodes: a first electrode capacitively coupled to the cutting tool to impart a signal to the cutting tool (such as plate or tube 44 shown in Figures 2-9 and 11), and a second electrode capacitively coupled to the cutting tool to monitor the signal imparted to the cutting tool (such as plate or tube 46 shown in Figures 2, 3, 5-9 and 11). A reaction system is adapted to stop movement of the cutting tool upon detection of contact (such

as reaction subsystem 24 shown schematically at 24 in Figure 1). Embodiments of machines with first and second electrodes as described in claim 12 are shown and discussed throughout applicant's disclosure, including but not limited to the embodiments shown in Figures 2-11 and discussed in paragraphs 38 through 74 of the specification as published, and on pages 14 through 29 of the specification as originally submitted.

6. Grounds of rejection to be reviewed on appeal.

The grounds of rejection presented for review are:

1) a rejection of claims 12-14 under 35 USC 103(a) as obvious in light of Friemann et al. (US Patent 3,858,095) combined with Masuda et al. (US Patent 5,231,359); and

2) a rejection of claims 10 and 12-14 under 35 USC 103(a) as obvious in light of Lokey (US Patent 3,785,230) combined with Masuda.

7. Argument.

Obviousness under 35 USC 103(a)

I. Rejection of claims 12-14 in light of Friemann and Masuda.

A. Claim 12.

Claim 12 was rejected under 35 USC 103(a) as obvious in light of Friemann (US Patent 3,858,095) combined with Masuda (US Patent 5,231,359). Friemann discloses a protective circuit for band cutter machines used in the textile industry. (Friemann, column 1, lines 5-11.) The machine includes a band cutter looped around several wheels. (Friemann, Figure 2.) A motor drives one of the wheels to move the cutter and a user slides a piece of textile past the moving cutter to cut the textile. The protective

circuit is designed to stop the cutter in the event a person touches the moving cutter. (Friemann, column 1, lines 45-47.) Friemann, however, does not disclose a contact detection system with electrodes capacitively coupled to a cutting tool, as required by claim 12, so the examiner cites Masuda for such a system. Masuda, however, does not disclose a contact detection system. Instead, it discloses a ceramic resonance type electrostatic sensor apparatus conventionally used "for detecting a change in capacitance between a video disk and a stylus." (Masuda, column 10, lines 21-23.) Masuda's disclosure addresses the issues of reducing the size of sensors, increasing sensitivity of sensors, providing a resonator element with an impedance that does not decrease when an object to be detected has a low impedance, allowing easy adjustment of an oscillation frequency, and providing multiple sensors which can perform accurate signal processing without causing interference. (Masuda, column 3, lines 35-56.) Nevertheless, the examiner said it would have been obvious "to substitute the detection system of Masuda for the detection system of Friemann et al." (Final Office Action mailed 9-7-05, p. 3).

The Board should reverse the rejection because: 1) Masuda is non-analogous art, 2) the cited references fail to teach or suggest all claim limitations, and 3) there is no suggestion to combine the references. Each of these points is an independent reason why the Board should reverse the rejection.

1. Masuda is non-analogous art.

The first step in an obviousness analysis is to identify the scope and content of the prior art. Graham v. John Deere Co., 383 U.S. 1, 17, 86 S.Ct. 684, 693-94, 15 L.Ed.2d 545, 148 USPQ 459, 467 (1966). In other words, one must determine what art

may be properly considered. Art that may be considered is called "analogous" while art that may not be considered is called "non-analogous." See In re Clay, 966 F.2d 656, 658, 23 USPQ2d 1058 (Fed. Cir. 1992). Whether a reference is analogous is a question of fact. Id.

The Federal Circuit has identified two criteria for determining whether a reference is analogous art. The first is whether the reference is from the same field of endeavor as applicant's invention. If it is, then the reference is analogous. If it is not, then the second criterion must be considered. The second criterion is whether the reference is reasonably pertinent to the particular problem addressed by the inventor. Id. at 658-659.

The Federal Circuit applied these criteria in the case of In re Clay, 966 F.2d 656, 658, 23 USPQ2d 1058 (Fed. Cir. 1992). In that case, the Federal Circuit reversed a rejection of claims to a process for storing liquid hydrocarbon in a tank having a dead volume between the bottom of the tank and its outlet. Id. at 657. The process included the step of placing gel in the dead volume. The claims were rejected in light of two references: Hetherington, which disclosed a petroleum storage tank that used bladders to fill the dead space at the bottom of the tank, and Sydansk, which taught using gel to fill anomalies in underground petroleum formations. Clay argued that Sydansk should not be considered because it was non-analogous art. The Board of Patent Appeals and Interferences, however, ruled that Sydansk was in the same field of endeavor, and therefore analogous, because the gel disclosed in Sydansk "would have a number of applications within the manipulation of the storage and processing of hydrocarbon liquids ... [and that] the gel as taught in Sydansk would be expected to function in a similar manner as the bladders in the Hetherington patent." Id. at 659.

Clay then appealed to the Federal Circuit. The first question addressed by the Federal Circuit was whether Sydansk was in the same field of endeavor as Clay. The court ruled that it was not, saying: "Sydansk cannot be considered to be within Clay's field of endeavor merely because both relate to the petroleum industry." *Id.* The court explained that Sydansk dealt with underground formations while Clay dealt with man-made storage tanks, and Sydansk's invention operated at high temperatures and pressures while Clay's invention operated at ambient temperature and atmospheric pressure. Because of these differences, the court ruled that the two references were from different fields of endeavor: "Clay's field of endeavor is the *storage* of refined liquid hydrocarbons. The field of endeavor of Sydansk's invention, on the other hand is the *extraction* of crude petroleum. The Board clearly erred in considering Sydansk to be within the same field of endeavor as Clay's." *Id.* (emphasis in original).

The Federal Circuit then considered the second criterion, whether Sydansk was reasonably pertinent to the problem addressed by Clay, and stated:

A reference is reasonably pertinent if, even though it may be in a different field from that of the inventor's endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem. Thus, the purposes of both the invention and the prior art are important in determining whether the reference is reasonably pertinent to the problem the invention attempts to solve. If a reference disclosure has the same purpose as the claimed invention, the reference relates to the same problem, and that fact supports use of that reference in an obviousness rejection. An inventor may well have been motivated to consider the reference when making his invention. If it is directed to a different purpose, the inventor would accordingly have had less motivation or occasion to consider it. (*Id.* at 659)

The Federal Circuit applied that standard and explained that the purpose of Clay's invention was to displace liquid from dead spaces in a storage tank while the purpose of Sydansk's invention was to recover oil from rock. The court also explained that a subterranean formation "is not structurally similar to, does not operate under the same temperature and pressure as, and does not function like Clay's storage tanks." Id. at 660. Because of these differences the court concluded that Sydansk was not reasonably pertinent to the problem addressed by Clay, and therefore, Sydansk was non-analogous and should not have been considered.

The situation in Clay is similar to the case at hand. Applicant's field of endeavor is imparting signals to cutting tools in woodworking machines via capacitive couplings, while Masuda's field of endeavor is "to provide a ceramic resonance type electrostatic sensor apparatus which is reduced in size and has a very high sensitivity." (Masuda, column 3, lines 37-39.) Woodworking machines and ceramic resonance type electrostatic sensors have different structures, operate under different principles, and serve different purposes. Clearly, the differences between these fields are greater than the differences between the fields of storing and extracting petroleum described in Clay, and as a result, applicant's invention and Masuda are from different fields of endeavor. Thus, the question becomes whether Masuda is reasonably pertinent to the problem addressed by applicant.

Masuda is not reasonably pertinent to the problem addressed by applicant because Masuda's sensor would not have commended itself to an inventor considering how to impart a signal to a cutting tool in a woodworking machine. There is no common purpose, structure or function between woodworking machines and ceramic resonance

type electrostatic sensors. In fact, there is no suggestion that a sensor as disclosed in Masuda would work in the environment of a woodworking machine. To the contrary, ceramic resonance type sensors are delicate and susceptible to interference, stray distributed capacitance, and inductance from power lines, all of which may be present in a woodworking machine. (Masuda, column 6, lines 36-40 and 47-61.) Moreover, Masuda explains that the conventional use of a ceramic resonance type sensor is "for detecting a change in capacitance between a video disk and a stylus," which is a very different application than a woodworking machine. (Masuda, column 10, lines 21-23.) Masuda identified several potential new applications for ceramic resonance type sensors, but those applications are also different than a woodworking machine and all of the applications involve detecting very slight changes in capacitance due to the proximity of an item to the sensor. None of the applications disclose how Masuda's sensor could impart a signal to a cutting tool, as required by applicant's claim 12, or how to detect contact with a cutting tool in a woodworking machine. The potential new applications of Masuda's sensor are:

a human body capacitance sensor (for detecting the entrance of a person into a room), a sensor mounted at high temperatures (e.g., a position sensor in a high-temperature furnace), a high-resolution rotary encoder, a small parts detecting element (e.g., an element for detecting chip capacitors and the like on a carrier tape), a gas sensor (a gas identification sensor based on the fact that a capacitance changes depending on a type of gas), a pulse sensor (a sensor for detecting a pulse by using a change in passing amount of iron contained in blood), and a sensor for detecting a phase transition point between a liquid phase and a solid phase (a sensor for detecting a change in dielectric constant at a transition point between a liquid phase and a solid phase in the state graphs of a solid, a liquid, and a gas). (Masuda, column 10, lines 26-40.)

Because of these differences, Masuda would not have logically commended itself to an inventor considering how to impart a signal to a cutting tool in a woodworking machine, and therefore, Masuda is not reasonably pertinent to the problem addressed by applicant. Just as extracting petroleum was not reasonably pertinent to storing petroleum in Clay because of differences in purpose, structure, operation and function, woodworking machines and ceramic resonance type sensors are not reasonably pertinent because of similar differences.

Another relevant case is In re Pagliaro, 657 F.2d 1219, 210 USPQ 888 (CCPA 1981). The invention in that case involved a process for preparing decaffeinated beverages. The invention used edible fats to extract the caffeine while the prior art used potentially toxic solvents. Id. at 1220. The examiner rejected the claims as obvious in light of a patent to Nutting combined with either a patent to Rector or an article by Aeillo. Nutting taught the conventional process of using solvents. Id. at 1221. Rector disclosed a method of making coffee by grinding coffee beans with oil and then extracting the oil, and Rector said the extracted oil was more heavily charged with the stimulative elements of the coffee. Id. Aeillo discussed the lipoid theory of narcotics, and specifically, the solubility of narcotics in fatty oils. Id. at 1221-1222. The Board of Patent Appeals and Interferences affirmed the rejection and Pagliaro appealed.

On appeal, the Court of Customs and Patent Appeals reversed the rejection because the Board misinterpreted Rector and because Aeillo was a non-analogous reference. The court's discussion of Aeillo is particularly relevant to the case at hand. The court explained:

We regard Aeillo as nonanalogous art, which cannot properly be considered pertinent prior art under 35 U.S.C. 103. In In re Wood, 599 F.2d 1032, 1036, 202 USPQ 171, 174 (Cust. & Pat. App.1979), this court stated: "In resolving the question of obviousness under 35 U.S.C. §103, we presume full knowledge by the inventor of all the prior art in the field of his endeavor. However, with regard to prior art outside the field of his endeavor, we only presume knowledge from those arts reasonably pertinent to the particular problem with which the inventor was involved. (Citation omitted.) The rationale behind this rule precluding rejections based on combination of teachings of references from nonanalogous arts is the realization that an inventor could not possibly be aware of every teaching in every art. Thus, we attempt to more closely approximate the reality of the circumstances surrounding the making of an invention by only presuming knowledge by the inventor of prior art in the field of his endeavor and in analogous arts."

The determination that a reference is from a nonanalogous art is therefore twofold. First, we decide if the reference is within the field of the inventor's endeavor. If it is not, we proceed to determine whether the reference is reasonably pertinent to the particular problem with which the inventor was involved.

Both the instant claims and Nutting involve decaffeination of vegetable materials; whereas, Aeillo compares the solubility of a diuretic solution, such as a caffeine solution combined with an oil/serum mixture, to the same solution combined with an oil/water mixture. He determines that caffeine is "more soluble in serum than in water." From this he concludes that the Meyer/Overton lipoid theory of narcotics, which was based upon experiments using an oil/water mixture, is inaccurate because an oil/water mixture does not approximate the substances found in the human body. Thus, Aeillo's disclosure is not "within the field of the inventor's endeavor." Further, Aeillo is not pertinent to appellants' problem because he is not concerned with either beverage preparation or decaffeination of vegetable materials. There is no common environment which could form a "close relationship" between either the claimed invention or Nutting on the one hand and Aeillo on the other to logically require consideration of Aeillo. In re Antle, 58 CCPA 1382, 1387, 444 F.2d 1168, 1171-72, 170 USPQ 285, 287-88 (1971). An earlier statement by this court in In re Van Wanderham, 54 CCPA 1487, 1494, 378 F.2d 981, 988, 154 USPQ 20, 25 (1967), is particularly appropriate: "Our determination here is not without difficulty. However, we think the difficulty arises from not considering the subject matter as a whole and instead focusing on the scientific principle involved"

In this case, the board erred by focusing on the affinity of olive oil for caffeine without considering the subject matter of Aeillo as a whole

and the impropriety of the Aiello reference, as pointed out above.
(Pagliaro, 657 F.2d at 1224-1225.)

In the case at hand, Masuda is not pertinent to applicant's claims because Masuda is not concerned with woodworking machines or imparting a signal to a cutting tool, just as in Pagliaro the Aiello reference was not pertinent because it did not concern beverage preparation or decaffeination of vegetable materials. There simply is no "common environment" or "close relationship" between a woodworking machine as set forth in applicant's claim 12 and a ceramic resonance type sensor as disclosed by Masuda, just as there was no "common environment" or "close relationship" between decaffeinating beverages and the solubility of a caffeine solution in Pagliaro. The examiner in the case at hand erred by focusing on the fact that Masuda disclosed a sensor to detect small changes in capacitance without considering how that sensor functions or whether it could be used in a woodworking machine to impart a signal to a cutting tool.

For all these reasons, Masuda is non-analogous art and should not be considered. This is an independent reason why the rejection of claim 12 should be reversed.

2. The cited references fail to teach or suggest all claim limitations.

Even if Masuda were analogous art, which it is not, it still would have to disclose a contact detection system as set forth in claim 12 in order for claim 12 to be obvious. See, e.g., 35 USC 103(a) (question is whether "the subject matter as a whole would have been obvious"); Application of Royka, 490 F.2d 981, 985 (CCPA 1974) (claim not obvious because limitation missing from cited references); Application of Wilson, 424

F.2d 1382, 1385 (CCPA 1970) ("All words in a claim must be considered in judging the patentability of that claim against the prior art."); MPEP 2143.03 ("To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art.")

The contact detection system of claim 12 "includes a first electrode capacitively coupled to the cutting tool to impart a signal to the cutting tool and a second electrode capacitively coupled to the cutting tool to monitor the signal imparted to the cutting tool." Matsuda does not disclose a first electrode to impart a signal or a second electrode to monitor the signal. Instead, Masuda uses "[a]n electrode plate, a needle, and the like for detecting a change in capacitance of an object to be detected," and Masuda directly connects those components to a detecting portion. (Masuda, column 5, lines 41-44.) Thus, Masuda does not disclose electrodes as required in claim 12, and as a result, claim 12 cannot be obvious in light of Friemann combined with Masuda. This is a second independent reason why the rejection of claim 12 should be reversed.

3. There is no suggestion to combine Friemann and Masuda.

Even if Masuda were analogous art, which it is not, and even if Masuda's sensor was a contact detection system as set forth in claim 12, which it is not, there still would have to be some teaching, suggestion, or motivation to modify Friemann to include Masuda's sensor. In re Rouffet, 149 F.3d 1350, 1355, 47 USPQ2d 1453 (Fed. Cir. 1998). The only motivation identified by the examiner to combine the references is the following:

Masuda discloses other types of capacitance detection system [sic] wherein a signal through an electrode is applied such that an electrode detector is used to sense a change in the capacitance in an object to be detected are [sic] equivalent structures known in the art. Therefore, because these two type [sic] of capacitance sensors are equivalent structures known in the art were [sic] art-recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute the detection system of Masuda for the detection system of Friemann et al. such that a signal is applied to the shaft and blade of Friemann et al. while also using an electrode to sense capacitance changes on the object due to a person touching the [sic] for the purpose of providing an enhanced detection system with high sensitive [sic]. (Final Office Action mailed 9-7-05, pp. 3-4.)

As far as this statement is understood, the examiner is saying the sensor disclosed in Masuda is equivalent to the detection system disclosed in Friemann, and therefore, a person of ordinary skill would have thought to replace Friemann's detection system with Masuda's sensor in order to provide an enhanced detection system. Applicant disagrees. Masuda's sensor is not equivalent to Friemann's detection system, and a person of ordinary skill would not have thought to replace Friemann's system with Masuda's sensor.

The sensor disclosed in Masuda is not equivalent to Friemann's system because it functions differently, i.e., it looks for very small changes in capacitance due to proximity of an item. The protective circuit disclosed in Friemman, in contrast, includes an oscillator with a voltage output connected to a bridge circuit. The bridge circuit is balanced until an operator touches the band cutter, at which time the bridge circuit becomes unbalanced and a voltage is transmitted to an amplifier circuit which, in turn, trips a relay to apply DC braking to the motor and to supply power to an electromechanical brake. (Friemann, column 3, line 7 to column 4, line 6.) Additionally,

the sensor disclosed by Matsuda is not equivalent because it requires components of specific size, configuration, material and electrical properties. (Matsuda, columns 5-8.) For example, Figures 7A, 7B and 7C show ceramic resonator elements specifically positioned on the surfaces of a copper film of a ceramic substrate 10 in such a way to minimize mutual interference between the resonator elements. (Matsuda, column 6, line 62 through column 7, line 12.) Friemann's system, in contrast, requires rollers that physically couple a band cutter to a bridge circuit. (Friemann, column 3, lines 7-20.) Masuda's sensor is also not equivalent because it is designed for environments like a video disk and stylus, while Friemann's system is designed to work in a band cutter for textiles. These facts show Masuda's sensor is not equivalent to or interchangeable with Friemann's system.

A person of ordinary skill would not have thought to replace Friemann's system with Masuda's sensor because of the differences discussed above. Moreover, if Matsuda's sensor could somehow be implemented in the band cutter disclosed in Friemann, then it is likely that the sensor would detect textile as it approached the band cutter, or it would detect a person's hand as it moved the textile past the cutter, and inadvertently trigger the brakes because the proximity of the textile or hand would cause a small change in capacitance. The system in Matsuda would have to be modified in some undisclosed way to distinguish proximity from contact, but there is no teaching or suggestion how to make such a modification. Because of this, there is no reasonable expectation that the system disclosed in Matsuda could be successfully implemented in a band cutter as shown in Friemann, and therefore a person of ordinary skill would not have thought to replace Friemann's system with Masuda's sensor.

In any event, the examiner's statement that a person of ordinary skill would combine Friemann and Masuda in order to provide an "enhanced detection system" is an insufficient motivation to support an obviousness rejection. If it were, then almost no improvement could be patented because one always desires "enhanced" products. Rather, there must be some specific understanding or technological principle in the prior art suggesting the specifically claimed combination. This is explained by the case of In re Rouffet, 149 F.3d 1350, 1355, 47 USPQ2d 1453 (Fed. Cir. 1998).

In Rouffet the Board of Patent Appeals and Interferences affirmed the rejection of an application concerning a satellite communication system. The application addressed the problem of how to keep a receiver on the earth in communication with a satellite moving around the earth. Typically, a satellite transmits multiple signal beams to the earth and a receiver must switch from one beam to another as the satellite moves. This switching from beam to beam is referred to as a handover, and a disruption in communication is more likely during a handover. Rouffet minimized the number of handovers required by changing the shape of the transmitted beams from cones to fans. Fan-shaped beams have elliptical footprints that extend parallel to the direction of a satellite's motion. The elliptical footprints help ensure that a fixed point on the earth will remain within the satellite's beam. Id. at 1353.

The examiner rejected Rouffet's claims as obvious in light of a patent to King, a patent to Rosen, and a conference report by Ruddy. King disclosed a system to launch a plurality of low-orbit satellites. Rosen disclosed a geostationary satellite using fan-shaped beams oriented in an east-west direction. Ruddy disclosed a television broadcast system that transmitted a single fan-shaped beam upward from the earth into

which satellites would successively enter. This fan-shaped beam was oriented so its long axis was aligned with the long axes of the satellites' orbits. Id. at 1356. The Board affirmed the examiner's rejection and added an alternative rejection based on the combination of two other patents. Rouffet then appealed to the Federal Circuit.

On appeal, the Federal Circuit found no error in the Board's conclusion that "the combination of King, Rosen, and Ruddy contains all of the elements claimed in Rouffet's application." Id. at 1357. Nevertheless, the Federal Circuit concluded "the Board reversibly erred in determining that one of skill in the art would have been motivated to combine these references in a manner that rendered the claimed invention obvious." Id. The Federal Circuit said the Board erred by failing to identify any specific understanding or scientific principle suggesting the combination. The court explained that an examiner cannot simply find claim elements in the prior art and then combine them to arrive at the invention because such an approach would allow hindsight to influence the determination. Rather, an examiner must find the claim elements in the prior art and then specify how the prior art suggests or motivates the combination of those elements. This is explained in the following discussion from Rouffet:

As this court has stated, "virtually all [inventions] are combinations of old elements." *Environmental Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 698, 218 U.S.P.Q. 865, 870 (Fed. Cir. 1983); see also *Richdel, Inc. v. Sunspool Corp.*, 714 F.2d 1573, 1579-80, 219 U.S.P.Q. 8, 12 (Fed. Cir. 1983) ("Most, if not all, inventions are combinations and mostly of old elements.") Therefore an examiner may often find every element of a claimed invention in the prior art. If identification of each claimed element in the prior art were sufficient to negate patentability, very few patents would ever issue. Furthermore, rejecting patents solely by finding prior art corollaries for the claimed elements would permit an examiner to use the claimed invention itself as a blueprint for piecing together elements in the prior art to defeat the patentability of the claimed invention. Such an approach would be "an illogical and

inappropriate process by which to determine patentability." *Sensonics, Inc. v. Aerosonic Corp.*, 81 F.3d 1566, 1570, 38 U.S.P.Q.2d 1551, 1554 (Fed. Cir. 1996).

To prevent the use of hindsight based on the invention to defeat patentability of the invention, this court requires the examiner to show a motivation to combine the references that create the case of obviousness. In other words, the examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed.

This court has identified three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art. In this case, the Board relied upon none of these. Rather, just as it relied on the high level of skill in the art to overcome the differences between the claimed invention and the selected elements in the references, it relied upon the high level of skill in the art to provide the necessary motivation. The Board did not, however, explain what specific understanding or technological principle within the knowledge of one of ordinary skill in the art would have suggested the combination. Instead, the Board merely invoked the high level of skill in the field of art. If such a rote invocation could suffice to supply a motivation to combine, the more sophisticated scientific fields would rarely, if ever, experience a patentable technical advance. Instead, in complex scientific fields, the Board could routinely identify the prior art elements in an application, invoke the lofty level of skill, and rest its case for rejection. To counter this potential weakness in the obviousness construct, the suggestion to combine requirement stands as a critical safeguard against hindsight analysis and rote application of the legal test for obviousness.

Because the Board did not explain the specific understanding or principle within the knowledge of a skilled artisan that would motivate one with no knowledge of Rouffet's invention to make the combination, this court infers that the examiner selected these references with the assistance of hindsight. This court forbids the use of hindsight in the selection of references that comprise the case of obviousness. *See In re Gorman*, 933 F.2d 982, 986, 18 U.S.P.Q.2d 1885, 1888 (Fed.Cir.1991). Lacking a motivation to combine references, the Board did not show a proper *prima facie* case of obviousness. This court reverses the rejection over the combination of King, Rosen, and Ruddy. (Rouffet, 149 F.3d at 1357-1358.)

This discussion is pertinent to the case at hand because the examiner in the present application did not identify any specific understanding or technological principle that would motivate a person of ordinary skill to replace Freimann's system with Masuda's sensor, just as the examiner in Rouffet failed to identify any such understanding or principle. The examiner's motivation to provide "an enhanced detection system" is simply a rote invocation of the desire for safer products used to justify the combination of references, just as the reliance on a high level of skill was a rote invocation used to justify the combination of references in Rouffet. As explained by the Federal Circuit, such rote invocations cannot provide the required motivation because then there would rarely be any patentable technical advance. Instead, a specific suggestion to make a combination is required, and that requirement must be diligently applied because, as the Federal Circuit has said, "invention itself is the process of combining prior art in a nonobvious manner." *Id.* at 1359. In the case at hand, the examiner failed to identify any specific suggestion to make the combination.

Another case explaining the requirement of a specific suggestion to combine references is In re Dembiczak, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999) (citations omitted), *abrogated on other grounds* in In re Gartside, 203 F.3d 1305, 53 USPQ2d 1769 (Fed. Cir. 2000). In that case the Board of Patent Appeals and Interferences affirmed the rejection of an application concerning a trash bag made to look like a jack-o'-lantern when filled with leaves or trash. The application was rejected in light of conventional plastic trash bags combined with orange crepe paper jack-o'-lanterns (referred to as the Holiday reference) and paper bag pumpkins (referred to as

the Shapiro reference). The Federal Circuit reversed the rejection because the Board did not identify a suggestion to make the combination. The Federal Circuit explained,

[R]ather than pointing to specific information in Holiday or Shapiro that suggest the combination with the conventional bags, the Board instead described in detail the similarities between the Holiday and Shapiro references and the claimed invention, noting that one reference or the other – in combination with each other and the conventional trash bags – described all of the limitations of the pending claims. ... Nowhere does the Board particularly identify any suggestion, teaching, or motivation to combine the children's art references (Holiday and Shapiro) with the conventional trash or lawn bag references, nor does the Board make specific -- or even inferential -- findings concerning the identification of the relevant art, the level of ordinary skill in the art, the nature of the problem to be solved, or any other factual findings that might serve to support a proper obviousness analysis. ...

...Yet this reference-by-reference, limitation-by-limitation analysis fails to demonstrate how the Holiday and Shapiro references teach or suggest their combination with the conventional trash or lawn bags to yield the claimed invention. ... Because we do not discern any finding by the Board that there was a suggestion, teaching, or motivation to combine the prior art references cited against the pending claims, the Board's conclusion of obviousness, as a matter of law, cannot stand. (Dembiczak, 175 F.3d at 1000.)

Just as in Dembiczak, the examiner in the case at hand simply found what he thought were the elements of applicant's claims, and then combined those elements according to applicant's teachings. As explained in Dembiczak, that type of analysis cannot support a conclusion of obviousness. The Federal Circuit clearly stated: "Combining prior art references without evidence of such a suggestion, teaching, or motivation simply takes the inventor's disclosure as a blueprint for piecing together the prior art to defeat patentability – the essence of hindsight." Id. at 999. In the case at hand, just as in Dembiczak, the examiner "fell into the hindsight trap." Id.

There simply is no such clear and particular suggestion to modify Friemann to include a sensor as disclosed in Masuda, and therefore, claim 12 is not obvious in light

of Friemann and Masuda. This is a third independent reason why the rejection of claim 12 should be reversed.

B. Claim 13.

Claim 13 was rejected under 35 USC 103(a) as obvious in light of Friemann (US Patent 3,858,095) combined with Masuda (US Patent 5,231,359). Claim 13 depends from claim 12 and is not obvious for the same reasons as claim 12. Additionally, claim 13 requires "excitation circuitry coupled to the first electrode, and where the excitation circuitry is adapted to generate a drive signal and output the drive signal onto the first electrode." Neither Friemann nor Masuda discloses any circuitry adapted to generate a drive signal and output the signal onto a first electrode, and therefore, those references cannot support an obviousness rejection of the claim. See, e.g., 35 USC 103(a) (question is whether "the subject matter as a whole would have been obvious"); Application of Royka, 490 F.2d 981, 985 (CCPA 1974) (claim not obvious because limitation missing from cited references); Application of Wilson, 424 F.2d 1382, 1385 (CCPA 1970) ("All words in a claim must be considered in judging the patentability of that claim against the prior art."); MPEP 2143.03 ("To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art.") The examiner did not explain his rejection of claim 13. (Final Office Action mailed 9-7-05, p. 2-3.)

C. Claim 14.

Claim 14 was rejected under 35 USC 103(a) as obvious in light of Friemann (US Patent 3,858,095) combined with Masuda (US Patent 5,231,359). Claim 14 depends from claim 12 and is not obvious for the same reasons as claim 12. Additionally, claim

14 requires "sensing circuitry coupled to the second electrode, where the sensing circuitry is adapted to sense the signal coupled to the second electrode from the cutting tool." Neither Friemann nor Masuda discloses any circuitry adapted to sense a signal on a second electrode, and therefore, those references cannot support an obviousness rejection of the claim. See, e.g., 35 USC 103(a) (question is whether "the subject matter as a whole would have been obvious"); Application of Royka, 490 F.2d 981, 985 (CCPA 1974) (claim not obvious because limitation missing from cited references); Application of Wilson, 424 F.2d 1382, 1385 (CCPA 1970) ("All words in a claim must be considered in judging the patentability of that claim against the prior art."); MPEP 2143.03 ("To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art.") The examiner did not explain his rejection of claim 14. (Final Office Action mailed 9-7-05, p. 2-3.)

II. Rejection of claims 10 and 12-14 in light of Lokey and Masuda.

A. Claim 10.

The examiner did not explain the rejection of claim 10 in the Final Office Action; he simply said the rejection of claim 10 remained. (Final Office Action mailed 9-7-05, p. 4.) Claim 10 had been previously rejected in light of Lokey (U.S. Patent 3,785,230) combined with Masuda. (Office Action mailed 1-24-05, p. 4.) However, claim 10 includes limitations similar to those in a number of allowed claims, and applicant believes claim 10 should have been allowed with the other allowed claims. It may be that the rejection of claim 10 was maintained inadvertently. In any event, claim 10 should be allowed for the reasons given below.

Claim 10 describes a woodworking machine with an electrically isolated arbor and a circular blade coupled to the arbor. An excitation system generates an electrical signal and a capacitive coupling couples the excitation system to the arbor to transfer at least a portion of the signal to the blade. The capacitive coupling includes two spaced-apart conductors with a dielectric between them, and a portion of the outer surface of the arbor is one of the conductors.

Lokey discloses a system to detect proximity between a person and a circular saw blade. The examiner, however, says Lokey discloses a contact detection system as required by claim 10. (Final Office Action mailed 9-7-05, p. 3.) That is incorrect. Lokey explicitly discloses proximity detection, not contact detection, as shown by the following quote:

The movement of the brakes 24 into engagement with the blade 13 is virtually instantaneous and the blade 13 stops *prior to even the slightest contact* with the body of the user regardless of the speed of movement of the users [sic] finger toward a contacting position with respect to the blade 13. (Lokey, column 2, lines 25-31, emphasis added.)

If the system in Lokey were somehow modified to detect contact instead of proximity, assuming it could be, then the system would not prevent serious injuries because the brakes in Lokey cannot operate quickly enough to stop the blade after contact has occurred. Specifically, the system disclosed in Lokey uses solenoids to move brakes into contact with the blade (as explained in Lokey at column 2, lines 7-15) and solenoids need time to operate. Detecting proximity gives the solenoids time to operate before a serious injury occurs, but detecting contact does not. Thus, modifying Lokey to include a contact detection system as required by claim 10 would render the

system unsatisfactory for its intended purpose, which is impermissible in an obviousness analysis.

This situation is similar to the case of In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). In that case, Gordon appealed the rejection of claims to a blood filter. The blood filter included an inlet and an outlet, both located at the bottom of the filter. The claims were rejected as obvious in light of a strainer for removing dirt and water from gasoline and oil. The strainer included both an inlet and outlet, but they were located at the top of the strainer, not the bottom. The examiner and the Board concluded it would have been obvious to turn the strainer upside down to have the inlet and outlet at the bottom, and therefore they rejected the claims. The Federal Circuit reversed, explaining that the strainer relied "at least in part, upon the assistance of gravity to separate undesired dirt and water from gasoline and other light oils," so if the strainer "were turned upside down, it would be rendered inoperable for its intended purpose." Id. at 902. The case of Gordon is analogous to the case at hand because the system disclosed in Lokey is based on proximity detection and that system would be rendered inoperable if modified to detect contact, just as the strainer of Gordon worked by gravity and would be rendered inoperable if turned upside down.

Additionally, Lokey fails to disclose "two-spaced-apart conductors with a dielectric between them, and where at least a portion of the outer surface of the arbor is one of the conductors." Instead, Lokey discloses a single "antenna 16 positioned close to the blade 13." (Lokey, column 1, lines 64-65.) Masuda also fails to disclose two conducts as required. The fact that Lokey and Masuda fail to disclose two conductors as recited in claim 10 means that not all claim limitations are taught or suggested by the

cited references, and as a result, the claims cannot be obvious in light of Lokey and Masuda. See, e.g., 35 USC 103(a) (question is whether “the subject matter *as a whole* would have been obvious”); Application of Royka, 490 F.2d 981, 985 (CCPA 1974) (claim not obvious because limitation missing from cited references); Application of Wilson, 424 F.2d 1382, 1385 (CCPA 1970) (“All words in a claim must be considered in judging the patentability of that claim against the prior art.”); MPEP 2143.03 (“To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art.”)

Additionally, Masuda should not be considered in this obviousness analysis because it is non-analogous art, as explained above. The examiner also failed to identify any specific teaching, suggestion or motivation to combine Lokey and Masuda. Instead, he simply said the desire for an enhanced detection system was sufficient motivation. (Office Action mailed 1-24-05, p. 5.) That is incorrect for the reasons given previously.

B. Claims 12-14.

Claims 12-14 were rejected under 35 USC 103(a) as obvious in light of Lokey combined with Masuda. That rejection should be reversed because Lokey discloses only a proximity detection system, not a contact detection system as required by the claims, and Lokey's brakes would not work with a contact detection system, as explained. Additionally, neither Lokey nor Masuda discloses first and second electrodes, as required by the claims. As stated, Lokey discloses a single “antenna 16 positioned close to the blade 13” (Lokey, column 1, lines 64-65), and Masuda does not disclose any such electrodes.

Additionally, Masuda should not be considered in this obviousness analysis because it is non-analogous art, as explained. The examiner also failed to identify any specific teaching, suggestion or motivation to combine Lokey and Masuda. Instead, he repeated his statement that the desire for an enhanced detection system was sufficient motivation. (Final Office Action mailed 9-7-05, p. 4.) That is incorrect for the reasons given previously.

8. Claims appendix.

1. (allowed) A woodworking machine comprising:
an electrically conductive cutting tool mounted on a rotatable, electrically conductive shaft;
a contact detection system for detecting configured to detect contact between a person and the cutting tool, where the contact detection system includes a capacitive coupling adapted to impart an electrical signal onto the cutting tool; and
a reaction system configured to cause one or more predetermined actions to take place upon detection of contact between a person and the cutting tool by the contact detection system;
where the capacitive coupling comprises at least a portion of the shaft as one conductive plate, a second conductive plate adjacent to and spaced apart from the shaft so that there is a gap between the shaft and the second conductive plate, and a dielectric in the gap between the shaft and second conductive plate.
2. (allowed) The machine of claim 1, further comprising a frame configured to support the shaft, and where the shaft is electrically insulated from the frame.

3. (allowed) The machine of claim 2, where the shaft is mounted in one or more bearings supported by the frame, and where the shaft is electrically insulated from the bearings by one or more electrically insulating components disposed between the shaft and the bearings.

4. (allowed) The machine of claim 2, where the shaft is mounted in one or more bearings supported by the frame, and where the shaft is electrically insulated from the frame by one or more electrically insulating components disposed between the bearings and the frame.

5. (allowed) The machine of claim 1, where the contact detection system includes one or more sense electrodes configured to monitor the electrical signal on the cutting tool.

6. (allowed) The machine of claim 5, where the one or more sense electrodes are disposed adjacent the shaft to monitor the electrical signal on the cutting tool through the shaft.

7-8. (canceled)

9. (allowed) The machine of claim 1, further comprising a motor assembly configured to rotate the shaft and cutting tool, and where the one or more predetermined actions include stopping the rotation of the cutting tool.

10. A woodworking machine, comprising:
a motor;
an electrically isolated, rotatable arbor configured to be driven by the motor,
where the arbor has an outer surface;
a circular blade coupled to the arbor;
an excitation system adapted to generate an electrical signal; and
a capacitive coupling adapted to capacitively couple the excitation system to the
arbor to transfer at least a portion of the electrical signal to the blade, where the
capacitive coupling includes two spaced-apart conductors with a dielectric between
them, and where at least a portion of the outer surface of the arbor is one of the
conductors.

11. (canceled)

12. A woodworking machine comprising:
a frame;
a conductive cutting tool supported by and electrically insulated from the frame;
a motor supported by the frame and adapted to drive the cutting tool;
a contact detection system adapted to detect contact between a person and the
cutting tool, wherein the contact detection system includes a first electrode capacitively
coupled to the cutting tool to impart a signal to the cutting tool and a second electrode
capacitively coupled to the cutting tool to monitor the signal imparted to the cutting tool;
and
a reaction system adapted to stop movement of the cutting tool upon detection
of contact between a person and the cutting tool by the contact detection system.

13. The machine of claim 12, where the contact detection system includes excitation circuitry coupled to the first electrode, and where the excitation circuitry is adapted to generate a drive signal and output the drive signal onto the first electrode.

14. The machine of claim 13, where the contact detection system includes sensing circuitry coupled to the second electrode, where the sensing circuitry is adapted to sense the signal coupled to the second electrode from the cutting tool.

15. (canceled)

16. (objected to) The machine of claim 12, further comprising a shaft electrically insulated from the frame, where the cutting tool is mounted on the shaft, and where at least one of the first or second electrodes is coupled to the cutting tool through the shaft.

17. (allowed) A woodworking machine, comprising:
an electrically conductive cutting tool;
a motor configured to drive the cutting tool;
a contact detection system configured to detect contact between a person and the cutting tool;

a capacitive coupling between the contact detection system and the cutting tool, where the capacitive coupling comprises at least a portion of the cutting tool as one conductive plate, a second conductive plate adjacent to and spaced apart from the cutting tool so that there is a gap between the cutting tool and the second conductive plate, and a dielectric in the gap between the cutting tool and second conductive plate;
and

a brake mechanism configured to engage and stop the cutting tool if contact between the person and the cutting tool is detected by the contact detection system;

where the contact detection system is configured to impart an electrical signal onto the cutting tool through the capacitive coupling, and to detect contact between a person and the cutting tool based on changes in the electrical signal imparted to the cutting tool.

18. (canceled)

19. (allowed) The machine of claim 1, where the portion of the shaft comprising part of the capacitive coupling is nominally circular in cross-section, and where the conductive plate is substantially concentric with that portion of the shaft.

20. (allowed) The machine of claim 19, where the conductive plate substantially encircles the portion of the shaft comprising part of the capacitive coupling.

21. (allowed) The machine of claim 17, where the cutting tool comprises a band blade.

22. (allowed) The machine of claim 17, where the cutting tool comprises a circular blade.

23. (allowed) The machine of claim 17, where the cutting tool comprises a circular blade mounted on an arbor.

24. (allowed) The machine of claim 17, where the cutting tool comprises an arbor with a circular blade and pulley mounted thereon.

9. Evidence appendix.

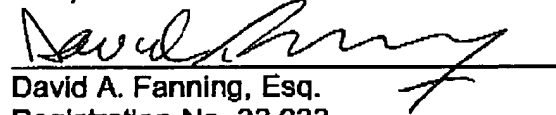
None.

10. Related proceedings appendix.

None.

Respectfully submitted,

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I hereby certify that this Appeal Brief is being deposited with the U.S. Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, or facsimile transmitted to the U.S. Patent and Trademark Office to number (571) 273-8300, on the date shown below.

Date: February 6, 2006


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